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10/738,359	12/17/2003	Kenneth I. Lipow	NRB-101A (501328.20107)	8565

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EXAMINER	
MARC, MCDIEUNEL	

ART UNIT	PAPER NUMBER
3664	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/738,359	LIPOW, KENNETH I.	
	Examiner	Art Unit	
	MCDIEUNEL MARC	3664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _11 September 2009_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _1-57_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-57_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _06 July 2004_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-57 are pending.

2. The rejection to claims 1-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Mack (*Minimally Invasive and Robotic Surgery,* 2001) is maintain.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 21 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Regarding claims of 21 and 22 theses phrase "capable of", renders the claim(s) indefinite because it is distinct, thereby rendering the scope of the claim(s) unascertainable.

Dependent claims not specifically rejected are rejected as being dependent upon a rejected base claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Mack (*Minimally Invasive and Robotic Surgery,* 2001).

As per claim 1, 10, 12, 14 and 18, Mack teaches Minimally Invasive and Robotic Surgery *a method of controlling a robotically driven surgical instrument for a surgeon* (see fig. on page 571, wherein the surgeon console being used as the robot's controller, thereby driven/manipulating/operating the surgical instruments as well as the camera) *comprising the steps of: locating a controller robot between a handle and the surgical instrument* (see fig. on page 571, wherein the console as been taken as between the handles and the instruments)*; sensing incident tremor force components applied by a surgeon to the handle* (see fig. on page 571, particularly hand tremor and table on page 570-"tremor function and force feedback", besides these types of surgical tools as been known for reducing tremor force)*; modulating the incident tremor force components to generate modulated tremor force commands* (see fig. on page 571 as noted above for "***minimally invasive surgery***"[1])*; and applying through the*

[1] **Minimally Invasive Surgery** = Computer-Enhanced Minimally Invasive Surgery System combines the technology of robotics with less traumatic minimally invasive surgery techniques. The surgeon positions three surgical arms over the patient. One arm holds

controller robot the modulated tremor force command onto the surgical instrument (see fig. on page 571, inherently the surgeon console in combination with the surgeon skill being responsible for reducing/modulating tremor); *a method of controlling a surgical instrument connected to a surgical robot* (see fig. on page 571, the surgeon console controls the surgical instrument of the robot) *comprising the steps of: locating a controller robot between a handle and a surgical instrument* (see fig. on page 571 as noted above)*; sensing incident reflectance force from a sensor when the surgical instrument is placed against body tissue* (see table on page 570 and fig. on page 571 for the body tissue)*; modulating the reflectance force components in the controller robot* (see table on page 570, particularly force feedback that the surgeon have dealt with by using the handles)*; and a motor outputting through the controller robot a modulated reflectance force on the handle* (see table on page 570, particularly force feedback and fig. on page 571, particularly the surgeon's console as noted above; inherently the handles contain motors for manipulating the instruments)*, wherein the modulation scaling step includes modulating the reflectance force in all degrees of freedom of the handle* (see fig. on page 571, particularly the hand movements and instrument tip movements as noted above); *monitoring forces applied to the robotically controlled surgical instrument by a patient's tissue in response to motion of the*

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a camera which allows the surgeon a three dimensional view of the surgical area, while the other two arms hold tiny surgical instruments such as scissors and suturing devices. The camera and instruments are inserted into small incisions in the patient (less than 1 cm wide).

The surgeon then sits at a console, just feet away from the patient, where he or she views the surgery site and manipulates instrument handles, much like the joysticks on a videogame. Some of the same procedures previously performed by opening a patient's chest can be accomplished through three small holes no larger than the diameter of a pencil. The most advanced software in computer technology allows for "motion scaling," or scaling hand movements so that large motions by the surgeon are reduced to micro-movements at the surgery site, which further increases the safety of the procedure.

robotically controlled surgical instrument (see table on page 570, particularly force feedback and fig. on page 571, particularly the console for monitoring the patient's tissue as noted above); *and applying resistive forces correlating to the monitored forces to the surgeon operator's input device in response to input provided by a surgeon operator* (see entire document, particularly fig. on page 571 as noted above the hand's and instrument's movement).

As per claim 2, Mack teaches Minimally Invasive and Robotic Surgery *that further comprising the step of displaying a signal representing the modulated tremor force on a display handle* (see fig. on page 571, particularly the surgeon console and hand tremor and table on page 570-"tremor function and force feedback").

As per claim 3, Mack teaches Minimally Invasive and Robotic Surgery *that further comprising the step of controlling and adjusting the modulated tremor force via a modulation parameter provided by a surgeon* (see fig. on page 571, particularly the surgeon console and hand tremor and table on page 570-"tremor function and force feedback" as noted above).

As per claims 4 and 5, Mack teaches Minimally Invasive and Robotic Surgery *wherein the modulation parameter is dependant upon historical data associated with a surgeon* (see entire document, inherently sophisticated software being responsible for keeping a log/historical data in its database/hard drive); *wherein the modulation parameter is dependant upon input provided by a surgeon during a procedure* (see fig. on page 571, particularly the surgeon console contains inherently a hard drive for saving historical data from the surgeon's procedure during operation).

As per claim 6, Mack teaches Minimally Invasive and Robotic Surgery *wherein at the step of applying the modulated tremor force commands; the modulated tremor force commands are applied in all degrees of freedom of the surgical instrument* (see fig. on page 570-571, particularly the fig. on page 571 as noted above).

As per claim 7, Mack teaches Minimally Invasive and Robotic Surgery *wherein at the step of modulating the incident tremor force compounds, the modulated tremor force commands are scaled dependent on a scaling parameter* (see table on page 570 and fig. on page 571; note that scaling inherently belongs to minimally invasive surgery).

As per claims 8 and 9, Mack teaches Minimally Invasive and Robotic Surgery *wherein at the step of outputting through the controller robot a modulated tremor force on the surgical instrument the output is smoothed; wherein at the step of modulating the incident force, force components, the modulated tremor force commands, or smoothed to eliminate anomalies* (see table on page 570 and fig. on page 571 as noted above).

As per claim 11, Mack teaches Minimally Invasive and Robotic Surgery *wherein the output is outputted in all degrees of freedom of the handle* (see fig. on page 571, particularly the hand movements).

As per claims 13, 16 and 17, Mack teaches Minimally Invasive and Robotic Surgery *comprising the further step of scaling the modulated force to a scaled output level for outputting through the controller robot* (see title; note that scaling inherently belongs to minimally invasive surgery)*; increase indicated forces to a level detectable by a surgeon operator* (see table on page

570, particularly force feedback; note that scaling inherently belongs to minimally invasive surgery).

As per claims 19-20, Mack teaches Minimally Invasive and Robotic Surgery *wherein said robotics portion comprises a left robotic arm and a right robotic arm, and wherein the interface portion comprises a left input device and a right input device* (see fig. on page 571, particularly the handle of the surgeon's console).

As per claims 21-25, Mack teaches Minimally Invasive and Robotic Surgery *wherein the input device is engageable to a handle emulating the handle of a surgical instrument, and further is capable of receiving input from the handle in six degrees of freedom; wherein said input device is further capable of receiving input from a seventh degree of freedom* (see fig. on page 571, particularly the handles).

As per claim 26, Mack teaches Minimally Invasive and Robotic Surgery *wherein the controller portion further comprises capability to direct the robotics arm to select specific surgical instrument units for engagement to the robotics arm* (see fig. on page 571).

As per claim 27, Mack teaches Minimally Invasive and Robotic Surgery *wherein said interface portion further comprises a microphone for receiving spoken input from a surgeon operator, and wherein said controller portion selects a surgical instrument unit for engagement to the robotics arm dependant on input received via the microphone* (see fig. table on page 570, wherein voice input contains microphone).

As per claims 28 and 29, Mack teaches Minimally Invasive and Robotic Surgery *wherein the robotics portion further comprises a left robotics arm and a right robotics arm, the robotics arms adapted to alternately engage varying surgical instrument units* (see fig. on page 571).

As per claims 30-32, Mack teaches Minimally Invasive and Robotic Surgery *wherein the controller portion further comprises capability to direct the robotics arms to select specific surgical instrument units for engagement to the robotics arms; wherein the varying surgical instrument units are selected dependant on a procedure to be performed* (using a robot to pick up a particular instrument falls under design choice)*; wherein the varying surgical instrument units making up the left supply are not identical to the varying surgical instrument units making up the right supply* (using different instrument falls under design choice).

As per claims 33-33, Mack teaches Minimally Invasive and Robotic Surgery *wherein the left supply and the right supply further comprises at least one instrument magazine engageable to the robotics arm* (using instrument magazine falls under design choice)..

As per claims 35-36, Mack teaches Minimally Invasive and Robotic Surgery *that further comprising a table adapter, the table adapter for receiving the robotics portion and indexing the robotics portion to a known location on the table* (see fig. on page 571, wherein the robot's base has been considered as table).

As per claims 37-38, Mack teaches Minimally Invasive and Robotic Surgery *wherein the workstation portion is engageable to the mobile base* (see fig. on page 571, particularly the robot console).

As per claim 39-44, Mack teaches Minimally Invasive and Robotic Surgery *further comprising an auxiliary interface connected to the controller portion; wherein the controller portions connected to a communications network* (see page 571, col. 1, second paragraph); *a database connected to said network, said database storing parameters associated with surgeons* (inherently the surgeon's console contains a computerized systems contains a database for storing data/history of the operation and medical procedure etc.).

As per claim 45, Mack teaches Minimally Invasive and Robotic Surgery *that further comprising computer aided tomography equipment connected to said network* (see wherein having tomography falls under design choice).

As per claims 46 and 47, Mack teaches Minimally Invasive and Robotic Surgery *that further comprising magnetic resonance imaging equipment connected to said network; wherein said at least one surgical instrument unit further comprises an imager, said imager viewing an area associated with a surgical instrument* (see fig. on page 571, wherein one of the arms is an imaging equipment connected a network).

As per claims 48-49, Mack teaches Minimally Invasive and Robotic Surgery *wherein said at least one surgical instrument comprises distance cueing capabilities; wherein said distance cueing capability comprises distance measuring equipment* (distance cueing falls under design choice).

As per claim 50, Mack teaches Minimally Invasive and Robotic Surgery *wherein said distance cueing capability comprises a plurality of light beams, the light beams aimed to converge at a location immediately in front of a surgical instrument associated with the surgical*

instrument unit (see fig. on page 571, wherein one of the arms is an imaging equipment broadly considered as contains light beams).

As per claim 51, Mack teaches Minimally Invasive and Robotic Surgery *wherein said workstation portion signals instrument contact with tissue to a surgeon operator when forces are first detected against the at least one instrument unit by the force detection sensors* (see fig. on page 571).

As per claims 52-53, Mack teaches Minimally Invasive and Robotic Surgery *wherein the controller portion is able to modulate control signals to the robotics arm dependant on a instrument lag parameter; and motion damping parameter; speed parameter* (using a lag/damping/speed/force parameter falls under design choice).

As per claims 56-57, Mack teaches Minimally Invasive and Robotic Surgery *wherein the controller portion is able to receive definition of a boundary past which a surgical instrument should not travel, said controller further being able to limit motion of the robotics arm to prevent interference between the surgical instrument and the boundary* (see fig. on page 1, pictorially the boundary between the controller have been provided).

Response to Arguments

8. As to the reference not teaching outputting through the controller robot a modulated force on the surgical instrument (see fig. on page 571 as noted above for "minimally invasive surgery");

As to the reference not teaching *a motor outputting through the controller robot a modulated reflectance force on the handle* (see table on page 570, particularly force feedback and fig. on page 571, particularly the surgeon's console as noted above; inherently the handles contain motors for manipulating the instruments);

As to reference not teaching "applying resistive forces correlating to the monitored forces to the surgeon operator's input device in response to input provided by a surgeon operator; wherein said resistive forces vary sufficiently rapidly to emulate forces resultant from tremor motions of a surgical instrument against a patient's tissue" (see fig. on page 571, particularly hand tremor and table on page 570-"tremor function and force feedback", besides these types of surgical tools as been known for reducing tremor force)

9. Applicant's arguments filed 09/11/2009 have been fully considered but they are not persuasive.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MCDIEUNEL MARC whose telephone number is (571)272-6964. The examiner can normally be reached on 6:30-5:00 Mon-Thu.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran can be reached on (571) 272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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